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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/660,521	09/12/2000	William S. Passman	99-447	6580

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EXAMINER	
PHAN, MAN U	

ART UNIT	PAPER NUMBER
2665	8

DATE MAILED: 06/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/660,521	Applicant(s) PASSMAN ET AL.	
	Examiner Man Phan	Art Unit 2665	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17,19-27 and 29-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,15-17,19-25 and 29-31* is/are rejected.

7)☒ Claim(s) *7-14,26 and 27* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *2, 3*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The application of Passman et al. for an "Using direct cluster member to cluster member links to improve performance in mobile communication systems" filed 09/12/2000 has been examined. Responsive to the restriction requirement filed on 04/23/2004, affirmation of the election has been made by applicant, and a provisional election was made without traverse to prosecute the invention of group I, claims 1-17, 19-27 and 29-31. Claims 18 and 28 are withdrawn from further consideration by the Examiner, 37 C.F.R. ' 1.142(b), as being drawn to a non-elected invention. Claims 1-17, 19-27 and 29-31 are pending in the application.

Claim Rejections - 35 USC ' 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor

and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 1038 and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-2, 15-17 and 19-22 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haas (US#6,304,556) in view of Toh (US#5,987,011).

With respect to claims 1-2, 15-17, both Haas (US#5,491,837) and Toh (US#5,987,011) disclose a novel system for sending data in a mobile communications networks having member stations arranged in clusters, according to the essential features of the claims. Haas (US#6,304,556) discloses in Fig. 3 a schematic diagram of the a network wherein the nodes are organized into at least one of a cluster, including a plurality of nodes 22s grouped into clusters 24, 26, 28, 30 of nodes, and a plurality of wireless links connecting the plurality of nodes 22s. In each cluster, one node labeled CH1, CH2, CH3 and CH4, respectively, is chosen to be a cluster head. The cluster heads thus form a tier-2 network 32. Note that the tier-1 and the tier-2 networks are separate. Routing between nodes that belong to the same tier-1 network is either peer-to-peer or through the cluster head. Each cluster head "knows" the identities of all the nodes in its cluster and the routes between the cluster head and the cluster node. A route between two nodes that belong to two different tier-1 networks is determined by the cluster head of the source node through querying the other cluster heads about the location of the destination. This querying is performed within the tier-2 network. The routing is then as follows: source node to its cluster head, source cluster head to destination cluster head, destination cluster head to the destination node. The first and the third segments are within tier-1 networks. The second segment is within the tier-2

network. The advantage of a multi-tier ad-hoc network is in the relatively efficient way that the routes are determined by the cluster heads. The disadvantage of the multi-tier approach is in increased congestion at the cluster head nodes, reduced system reliability due to a single point of failure, and in sub-optimality of routing paths (Col. 8, lines 37 plus and Col. 19, lines 28 plus). Further Fig. 1A illustrated one of the communications nodes 12, includes a transceiver 15 for transmitting and receiving communications to and from the other nodes 12 in the network 10. In addition, the node 12 includes a processor 16 for processing information requests from other nodes, managing node routing and location information, etc., a memory 17 is also interfaced to the processor 16 for storing a database of node location and route information for all other nodes in the subject node's routing zone, as well as route information for other nodes outside the subject node's routing zone(Col. 6, lines 55 plus and Col. 10, lines 11 plus).

In the same field of endeavor, Toh (US#5,987,011) discloses a routing method for supporting ad-hoc mobile communications within a radio communications network. The network comprises a plurality of mobile hosts including a source mobile host and a destination mobile host, and a plurality of radio communications links connecting together with mobile hosts. The method comprises measuring the stability of the communications links between neighbouring mobile hosts using an associativity based characteristic and selecting a communications route through the network from the source mobile host to the destination mobile host based on the stability of the communications links. The associativity characteristic is measured by each mobile host periodically transmitting and receiving identifier beacons (ticks) and updating the status of its corresponding links. The greater the number of ticks associated with a given link, the greater its stability. Use of the associativity characteristic enables the routing method to deal

efficiently with mobile host migrations throughout the network (Col. 3, lines 25 plus and Col. 21, lines 18 plus). Furthermore, the method of Toh's present invention is hereinafter referred to as Associativity-Based Routing (ABR). ABR is a compromise between broadcast and point-to-point routing and uses the previously mentioned connection-oriented packet forwarding approach (*scheduling, routing and access control decision made in a previous time frame of the network*). ABR only maintains routes for source mobile hosts that actually desire routes. However, ABR does not employ route reconstruction based on alternative route information stored in intermediate nodes, which advantageously avoids stale routes. In addition, routing decisions are performed at the destination mobile host and only the best route will be selected and used while all other possible routes remain passive, thereby avoiding packet duplicates. Furthermore, the selected route tends to be more long-lived due to the property of associativity (Col. 7, lines 52 plus).

Regarding claims 19, 21, 22, they are method claims corresponding to the apparatus claims 1-2, 15-17 above. Therefore, claims 19, 21, 22 are analyzed and rejected as previously discussed with respect to claims 1-2, 15-17.

Regarding claims 29-31, they are system claims corresponding to the apparatus and method claims 1-2, 15-17 and 19, 21, 22 above. Therefore, claims 29-31 are analyzed and rejected as previously discussed with respect to claims 1-2, 15-17 and 19, 21, 22.

Regarding claim 20, this claim differ from claims Haas in view of Toh in that the claim recited a computer program product for performing the same basis of steps and apparatus of the prior arts as discussed in the rejection of claims 1-2, 15-17 and 19, 21, 22. It would have been obvious to a person of ordinary skill in the art to implement a computer program product in Haas

in view of Toh for performing the steps and apparatus as recited in the claims with the motivation being to provide the efficient enhancement to a network communications having member stations arranged in cluster, and easy to maintenance, upgrade.

One skilled in the art would have recognized the need for effectively and efficiently routing data in a mobile ad-hoc wireless networks, and would have applied Toh's novel routing method for supporting ad-hoc mobile communications within a radio communication network into Haas' network communication protocols for routing and mobility management. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Toh's routing method for ad-hoc mobile networks into Haas' routing and mobility management protocols for ad-hoc networks with the motivation being to provide a method and system for performing scheduling, routing and access control in a wireless network.

4. Claims 3-6 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Haas (US#6,304,556) in view of Toh (US#5,987,011) as applied to the claims above, and further in view of Haartsen (US#5,491,837).

With respect to claims 3-6, Toh and Haas disclose the claimed limitations discussed in paragraph 3 above. In the same field of endeavor, Haartsen (US#5,491,837) discloses a method for dynamically allocating channels in a communication system which maximizes system capacity and link quality while minimizing the transmitted power of the mobile radiotelephones. Haartsen teaches in Figs. 5 & 6 flow charts illustrated the uplink and downlink allocation of channels within a radio communication system, specifically a cellular network which comprising the steps of: (a) measuring, in a mobile station, received signal strength indications (RSSIs) of

control signals broadcast from at least one base station; (b) determining a path loss between the mobile station and the at least one base station using the RSSI measurements; 8 measuring, in the at least one base station, an RSSI of interference signals on a plurality of available traffic channels; (d) determining transmit powers required for the mobile station to produce a signal on each of the plurality of available traffic channels at the at least one base station, wherein a strength of the signal is a predetermined level above a corresponding RSSI interference level measured on a traffic channel taking into consideration the path loss; and (e) assigning one of the plurality of available traffic channels as an uplink channel based on the determined transmit powers (TPL) (Col. 7, lines 5 plus and Col. 19, lines 28 plus).

Regarding claims 23-25, they are method claims corresponding to the apparatus claims 3-6 above. Therefore, claims 23-25 are analyzed and rejected as previously discussed with respect to claims 3-6.

One skilled in the art would have recognized the need for effectively and efficiently routing data in a mobile ad-hoc wireless networks, and would have applied Haartsen's node level performance in a distributed performance measurement system, and Toh's novel routing method for supporting ad-hoc mobile communications within a radio communication network into Haas' network communication protocols for routing and clustered mobility management. Therefore, It would have been obvious to a person of ordinary skill in the art at the time of the invention was made to apply Haartsen's method and system for channel allocation using power control and mobile-assisted handover measurements, and Toh's routing method for ad-hoc mobile networks into Haas' routing and mobility management protocols for ad-hoc networks with the motivation

being to provide a method and system for performing scheduling, routing and access control in an a clustered wireless network.

Allowable Subject Matter

5. Claims 7-14 and 26, 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is an examiner's statement of reasons for the indication of allowable subject matter: The closest prior art of record fails to disclose or suggest wherein the mobile communications station directly communicates with the first member station when the member beacon RSSI of the first member station is greater than an RSSI of the affiliated cluster head an additional value, as expressly recited in the claims.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The Li (US#6,349,091) is cited to show the method and apparatus for controlling communication links between network nodes to reduce communication protocol overhead traffic.

The Chen (US#6,744,740) is cited to show the network protocol for wireless device utilizing location information.

The Krishnamurthy et al. (US#6,735,448) is cited to show the power management for throughput enhancement in wireless ad-hoc networks.

The Passman et al. (US#6,493,759) is cited to show the cluster head resignation to improve routing in mobile communication systems.

The Passman et al. (US#6,662,229) is cited to show the cluster head resignation to improve routing in mobile communication systems.

The Zavgren, Jr. et al. (US#6,711,409) is cited to show the node belonging to multiple clusters in an ad-hoc wireless network.

The Elliott (US#6,456,599) is cited to show the distribution of potential neighbor information through an ad-hoc network.

The Ramanathan (US#5,850,592) is cited to show the method for self organizing mobile wireless station network.

The Okanoue (US#6,307,843) is cited to show the ad-hoc network of mobile hosts using link table for identifying wireless links and destination addresses.

The Redi (US#6,512,935) is cited to show the energy conserving network protocol.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. Phan whose telephone number is (703)305-1029. The examiner can normally be reached on Mon - Fri from 6:30 to 3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached on (703) 308-6602. The fax phone number for the organization where this application or proceeding is assigned is (703)305-3988.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

9. ***Any response to this action should be mailed to:***

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 305-9051, (for formal communications intended for entry)

Or: (703) 305-3988 (for informal or draft communications, please label "PROPOSED" or "DRAFT")

Hand-delivered responses should be brought to Crystal Park II, 2021 Crystal Drive, Arlington. VA., Sixth Floor (Receptionist).

Mphan

06/08/2004.

MAN PHAN
PATENT EXAMINER